

Serial No. 09/420,912



IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS
AND INTERFERENCES

Patricia Lewis
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Patent Application

Inventors: **Jon A. Ford**
Case No.: **Ford 1**
Serial No.: **09/420,912** Group Art Unit: **3623**
Filing Date: **October 20, 1999**
Examiner: **Eric T. Shaffer**
Title: **Arrangement For Resource and Work-Item Selection**

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SIR:

APPLICANT'S/APPELLANT'S APPEAL BRIEF

This is an appeal from an obviousness rejection of the claims of an application relating to workflow management, such as in a call center. Appellant requests that the Board reverse the rejection as erroneous.

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REAL PARTY IN INTEREST

The real party in interest is Avaya Technology Corp., the assignee of the above-identified application, as evidenced by the Assignment from the inventor to Lucent Technologies Inc. recorded on Reel 010330 Frame 0959, and by the assignment from Lucent Technologies Inc. to Avaya Technology Corp. recorded on Reel 012707 Frame 0562 of the United States Patent and Trademark Office assignment records.

RELATED APPEALS AND INTERFERENCES

None.

STATUS OF CLAIMS

Claims 1-24 and 27-59 are pending; claims 25 and 26 were canceled.

All pending claims stand rejected under 35 U.S.C. §103(a) over U.S. patent number 5,963,911 (Walker et al.) in view of U.S. patent number 6,389,400 (Bushey et al.).

The appealed claims are claims 1-24 and 27-59.

STATUS OF AMENDMENTS

No amendments were filed subsequent to final rejection.

SUMMARY OF THE INVENTION

The inventor has invented an improved way of selecting resources (such as call-center agents) to process work-items (such as calls), and also an improved way of selecting work-items for processing by resources.

This improved resource-selection and work-item-selection arrangement (106 in Fig. 1) attempts to match work items (100 in Fig. 1) with resources (104 in Fig. 1) in such a way that it brings the most value to all of the stakeholders in the workflow, e.g., customers, resources, managers, etc. The arrangement defines resources as having particular skills (202 in Fig. 2) and levels of proficiency in those skills (204 in Fig. 2), as is conventional. When work items arrive for processing, the arrangement classifies them as

requiring certain skills (304 in Fig. 3), as is also conventional. Under resource-surplus conditions (Fig. 4), the arrangement determines those available resources that possess skills needed by an available work item (404 in Fig. 4), and for each resource that has the requisite skills, it determines a business value of having that resource service the work item (420 in Fig. 4), where the business value is a measure of qualification of the resource for servicing the work item based on skills of the resource and skill requirements of the work item (page 6, lines 11-15), as is conventional. The arrangement further determines, for each resource that has the requisite skills, a value to that resource of servicing the work item (422 in Fig. 4), where the value to the resource is significantly and explicitly defined as a measure of how the resource is spending time compared with other resources and goals of the individual resource (page 6, lines 16-20). The arrangement then selects the resource that has a best combined value (424 in Fig. 4) of the business value and the value to the resource, to serve the work item (428 in Fig. 4). Under work-item-surplus conditions (Fig. 5), the arrangement determines those available work items that need skills possessed by an available resource (504 in Fig. 5), and for each work item that needs the available skills, it determines the business value of having that work item serviced by the resource (520 in Fig. 5), as is conventional. The arrangement further determines, for each work item that needs the available skills, a value to that work item of being serviced by the resource (522 in Fig. 5), where the value to the work item is significantly and explicitly defined as a measure of how the work item is treated compared to other work items and treatment goals of the individual work item (page 6, lines 21-25). The arrangement then selects the work item that has a best combined value (524 in Fig. 5) of the business value and the value to the work item, to be served by the resource (528 in Fig. 5). (Page 2, lines 6-26.)

Illustratively, the arrangement indicates a weight for each skill needed by a work item, and the business value is computed as a sum of products of a proficiency level of the resource in each of the skills and the weight of that skill of the work item (page 7, line 28, to page 8, line 22). Further

illustratively, the arrangement keeps track of treatments that are being given to resources and work items: e.g., for resources, it keeps track of a time since the resource became available, a time that the resource has not spent serving work items, and a measure of an effect that serving a work item would have on a goal of the resource (page 8, line 23, to page 9, line 3); and for work items, it keeps track of a time that the work item has been waiting for service, an estimated time that the work item will have to wait for service, and a time by which the work item has exceeded its target wait time (page 11, lines 1-10): The values to the resource and to the work item are then computed from these treatments. Illustratively, the arrangement indicates a weight to be given to each of the treatments, whereupon the value to a resource is computed as a sum of products of each treatment of the resource and the weight of the treatment (page 9, lines 4-9), and the value to a work item is computed as a sum of products of each treatment of the work item and the weight of that treatment (page 11, lines 11-16). (Page 2, line 29, to page 3, line 15.)

Preferably, all of the computed values are scaled, i.e., normalized, to ensure that the degree of their effect on the final combined value stays within predetermined bounds (page 13, line 20, to page 15, line 3). Determining a business value preferably involves determining a weighted business value, which is the business value weighted by a business value weight that preferably is common to all available or determined resources under resource-surplus conditions and that is common to all or available or determined work items under work-item-surplus conditions. Also, determining a value to the resource preferably involves determining a weighted value to the resource, which is the value to the resource weighted by a resource value weight that is preferably common to all available or determined resources, and determining a value to the work item preferably involves determining a weighted value to the work item, which is the value to the work item weighted by a work-item value weight that is preferably common to all available or determined work items. Selecting a resource or a work item then involves selecting the resource or work item that has the best combined value (e.g.,

sum) of the weighted business value and the weighted value to the resource or work item. (Page 3, line 16, to page 4, line 2; page 20, line 18, to page 21, line 27.)

ISSUES

The issue presented for review is:

Is the rejection of claims 1-24 and 27-59 under 35 U.S.C. §103(a) as rendered obvious by Walker et al. in view of Bushey et al. in error?

GROUPING CLAIMS

For purposes of this appeal, the appealed claims are grouped into 10 groups as follows:

Group A comprising independent claims 1, 9, 10, 28, 29, 32, 33, 36, 44, and 45 and dependent claims 27/1, 27/9, and 27/10;

Group B comprising independent claims 13, 21, 30, 31, 34, 35, 48, and 56, and dependent claims 27/13 and 27/21;

Group C comprising dependent claims 2, 14, 27/2, 27/14, 37, and 49;

Group D comprising dependent claims 3, 6, 7, 8, 15, 18, 19, 27/3, 27/6, 27/7, 27/8, 27/15, 27/18, 27/19, 38, 41, 42, 43, 50, 53, and 54;

Group E comprising dependent claims 4, 16, 27/4, 27/16, 39, and 51;

Group F comprising dependent claims 5, 17, 27/5, 27/17, 40, and 52;

Group G comprising dependent claims 20, 27/20, and 55;

Group H comprising independent claims 21, 31, 35, and 56, and dependent claim 27/21;

Group I comprising dependent claims 22, 27/22, and 57; and

Group J comprising dependent claims 11, 12, 23, 24, 27/11, 27/12, 27/23, 27/24, 46, 47, 58, and 59.

ARGUMENTS

1. The disclosure of Walker et al.

Walker et al. disclose an arrangement for effecting a time-based optimum allocation of resources (technicians) to jobs. They select the jobs

that must be performed by some deadline time and resources that are expected to become available within that time. They then calculate the projected time-dependent cost of allocating each job to each resource, i.e., the cost of each job/resource combination (col. 1, line 55, to col. 2, line 5). An incompatible job/resource combination (e.g., the resource not having the skills necessary to perform the job) is deemed to have "infinite" cost (col. 2, lines 20-25). The calculation includes a weighted probability of suffering a penalty for failing to complete the job on time (col. 6, line 64, to col. 7, line 24). Walker et al. then effect the combination (i.e., the job-to-resource assignment) that has the lowest cost (col. 2, lines 6-12). Walker et al. thus perform only a single value-computation for each combination, and then select the combination that has the best value (best cost). In the language of our claims, Walker et al. may be considered to determine the business value of having a resource service a work item, and selecting from those resources that possess the skills needed by the work item a resource to service the work item that produces the highest business value (lowest cost).

2. The disclosure of Bushey et al.

Bushey et al. disclose an arrangement for optimized routing of customer calls to call-center agents. The arrangement creates a behavioral model of a calling customer and a behavioral model of a plurality of agents, matches the customer's behavioral model against the agents' behavioral models, and routes the call to the available agent whose behavioral model best matches the customer's behavioral model (col. 2, lines 43-52 and col. 9, lines 1-35). The customer's behavioral model is calculated from a profile of the customer's needs, task objective, sales preferences, and expectation for satisfaction (col. 3, lines 17-21). The model consists of values of attributes of these profile entities (col. 3, line 22). For example, the attributes of the customer's expectations for satisfaction include their willingness to be up-sold, preferences for length of negotiation, desire to have questions answered, etc. (col. 3, lines 23-37, and col. 7, lines 36-40). An agent's behavioral model is calculated from attribute values of the agent's sales strategies, customer service behaviors, sales performance, etc. (col. 3, lines

42-55, and col. 7, lines 17-20). Weighting values are applied to the attribute values to reflect the attributes' relative importance (col. 3, lines 55-59, and col. 5, lines 1-3). The best match between a customer behavioral model and an agent behavioral model is the one producing the highest match score (col. 4, lines 7-9). It should be noted that at least the value to the customer or the customer's call of how the call is treated compared to other calls, or a measure of how the agent is spending time compared with other agents, are not considered in the above.

While both have optimum resource-to-work item assignment as their objective, Bushey et al.'s and Walker et al.'s arrangements are alternatives to each other in achieving this objective. Neither discloses, teaches, suggests, or offers motivation for combining pieces of their individual arrangements into a new hybrid arrangement.

3. The references do not render group A claims unpatentable.

Group A claims recite in part determining a value to the resource (e.g., a call-center agent) of servicing the work items (e.g., calls to the call center), also referred to as determining a resource treatment value, wherein the value to the resource or the resource treatment value is explicitly defined as "a measure of how the resource is spending time compared with other resources and goals of the individual resource."

The Examiner acknowledged that Walker et al. lack this teaching, but asserted that Bushey et al. "teaches incorporating the goals of a resource by weighting attributes to create an agent model (see column 4, lines 1-3)" and that "Bushey et al. discloses measuring how a resource is spending time compared with other resources and that resource's goals by creating an agent model (by weighting attributes) and comparing the customer's model with the agents' model (see column 4, lines 1-33)."

Applicant has argued that the Examiner's assertion is incorrect. Column 4, lines 1-3, of Bushey et al. merely state that "the weighting value for each attribute is used in calculating and constructing of an agent model." Neither the weighting values nor the attributes are disclosed as relating to the

goals of a resource. The weighting value is merely described as being "based on a relative importance of each attribute," column 3, lines 58-59. The agent model is described as being constructed by "using the sales strategies attributes values, customer service behaviors attributes values, and sales performance attributes values," column 3, lines 52-55. It should therefore be evident that, contrary to the Examiner's assertion, the passage of Bushey et al. referenced by the Examiner does not disclose incorporating the goals of a resource.

Applicant has also pointed out that column 4, lines 1-33, of Bushey et al. referenced by the Examiner further state that performance-optimizing calculations are used to generate match scores for agents, that the best match agent is the agent with the highest match score, that a list of optimal agents is generated based on agent match scores that are above an optimal threshold, that the customer request is routed to an available agent on the list of optimal agents, that the customer request is placed in a wait queue until an agent on the list of optimal agents becomes available, that additional agents are added to the list of optimal agents the longer the request from this customer remains in the wait queue, that the additional agents are added after reducing the optimal threshold, that wait time increases while the customer request is in the wait queue, that the customer request is routed to an available agent with the highest match score when the wait time equals a maximum wait time, and that the optimal threshold and the maximum wait time are set by a call center controller. The descriptions of the weighting value and the agent model (column 3, lines 52-55 and 58-59), which go into the computation of the match score, were already discussed above. The customer model, which also goes into the computation of the match score, is described as being constructed from the customer's historical information, information regarding the customer's current task objective, and the customer's current expectations for satisfaction such as his willingness to be up-sold, his preference for lengthy or brief negotiations, and his desire to have questions answered (column 3, lines 14-41). None of this material includes even a suggestion of measuring how a resource is spending time

compared with other resources. It should therefore be evident that, contrary to the Examiner's assertion, the passage of Bushey et al. referenced by the Examiner and directed to creating an agent model and comparing the customer's model with the agent's model, does not disclose measuring how a resource is spending its time compared with other resources and that resource's goals.

In summary, applicant had pointed out that Group A claims recite "a measure of how the resource is spending time compared with other resources and goals of the individual resource," and has shown that there is no comparable teaching in Bushey et al.

In response, the Examiner found applicant's arguments unpersuasive because "Bushey does teach incorporation of goals in that 'the invention includes calculating and constructing the agent model using sales strategies' (column 3, lines 60-62), where strategies are the definitions of the goals and the means by which the goals are achieved."

The Examiner's response does not address applicant's argument. Even if the Examiner's assertion is completely accurate, it still does not show that Bushey et al. disclose "a measure of how the resource is spending time compared with other resources and goals of individual resources."

The Examiner dismissed the applicant's other arguments explaining why Bushey et al. do not disclose "measuring how a resource is spending its time compared with other resources and goals of the individual resource", by saying that "Bushey does teach how an agent spends their time in that 'agent availability information from at least two agents' (column 4, lines 55-56), teaches that if an agent is not available, then they are spending their time working and if said agent is available, then they are spending their time not working and are in fact waiting to be employed."

Once again, even if the Examiner's assertion were completely accurate, it still does not show that Bushey et al. disclose "a measure of how the resource is spending time compared with other resources and goals of the individual resource" (emphasis added). The Examiner has failed to show how determining and indicating the busy/idle status of individual agents includes, or even implies, a

measure of how an agent is spending time compared with other agents and goals of the individual agent. Hence, the Examiner has failed to make a prima-facie case of unpatentability.

Since the art relied upon by the Examiner fails to disclose, teach, or suggest the explicit recitations of applicant's Group A claims, the rejection of these claims and all claims dependent therefrom is not well founded.

4. The references do not render group B claims unpatentable.

Group B claims recite in part determining a value to the work item (e.g., a call to a call center) of being serviced by the resource (e.g., a call center agent), also referred to as determining a work item treatment value, where the value to the work item or work item treatment value is explicitly defined as "a measure of how the work item is treated compared to other work items and treatment goals of the individual work item." The Examiner acknowledged that Walker et al. lack this teaching. But the Examiner asserted that: "Bushey et al. teaches creating a model of the customer based on their preferences, skills and other attributes (see column 3, lines 14-67). Bushey et al. also teaches selecting a determined work item, or customer, that has a best combined value of the business value and the value to the work item to be served by the resource as the highest match score between the agent and the resource is selected (see column 4, lines 1-33)." The Examiner further asserted that: "Bushey et al. discloses creating a weighted attribute for each customer (see column 3, lines 14-67). Bushey et al. also discloses comparing the customer model with the agent model to determine the highest match score (see column 4, lines 7-9). If the customer cannot have the highest score matched agent, after a predetermined period of time the second best matching agent answers the call (see column 4, lines 20-29)."

The disclosures of the passages referenced by the Examiner have already been discussed above in conjunction with the Group A claims. Even if the Examiner's just-cited characterization of these disclosures were correct, even the Examiner did not go so far as to actually assert that they disclose "a

measure of how the work item is treated compared to other work items and treatment goals of the individual work item.” And, indeed, there is no such disclosure. In particular, the passages of Bushey et al. referenced by the Examiner contain not one iota of a suggestion of a measure of how the work item is treated compared to other work items, as the preceding discussion of the disclosure of these passages amply shows. And since “a measure of how the work item is treated compared to other work items and treatment goals of the individual work item” is an explicitly recited requirement of each of the Group B claims, the references do not and cannot render unpatentable these claims and all claims that depend therefrom.

In summary, applicant had pointed out that Group B claims recite “a measure of how the work item is treated compared to other work items and treatment goals of the individual work item,” and has shown that there is no comparable teaching in Bushey et al.

In response, the Examiner found applicant’s argument unpersuasive because “Bushey does teach incorporation of goals in that ‘the invention includes calculating and constructing the agent model using sales strategies’ (column 3, lines 60-62), where strategies are the definitions of goals and the means by which goals are achieved.”

Once again, the Examiner’s response does not address applicant’s argument. Even if the Examiner’s assertion is completely accurate, it still does not show that Bushey et al. disclose “a measure of how the work item is treated compared to other work items and treatment goals of the individual work item.”

Moreover, this purported teaching of Bushey et al. is the same teaching that the Examiner identified in conjunction with the Group A claims as disclosing “a measure of how the resource is spending time compared with other resources and goals of the individual resource.” So which is it, the one or the other? Or, does it teach both, and if so, how? The Examiner does not say. Applicant asserts that it is neither.

The Examiner also found applicant’s argument unpersuasive because “Bushey does in fact teach how a work item is treated with respect to other work items in that ‘performance optimizing calculations are used to generate a match

score' (column 4, lines 4-6), which is how matching occurs. Matches are determined by the result of performance optimization calculations, which is a calculation that does in fact relate work items to each other."

The Examiner's characterization of Bushey et al.'s disclosure is inaccurate. The passage cited by the Examiner states in full that "performance optimizing calculations are used to generate a match score for each of the at least two agents" (emphasis added). Thus, these measures are measures for resources/agents and not for work items. Moreover, the performance-optimization calculations indicate the degree of match between a plurality of resources and one work item, not between a plurality of work items. How resources match a work item gives no indication whatsoever of "how the work item is treated compared to other work items and treatment goals of the individual work item" (emphasis added).

Since the art relied upon by the Examiner fails to disclose, teach, or suggest the explicit recitations of applicant's Group B claims, the rejection of these claims and all claims dependent therefrom is not well founded.

5. The references do not render group C claims unpatentable.

Group C claims recite using a business value weight and a work item value weight, both corresponding to the work item, to weigh the business value and the value to the work item. The Examiner asserted that Walker et al. disclose weighted values at col. 7, lines 35-59. In fact, the referenced passage of Walker et al. does not disclose, teach, or suggest any weighting at all.

But even if Walker et al. do in general suggest the use of weighted values, and acknowledging that Bushey et al. do disclose the use of weighted values, it is still not seen how Walker et al., and Bushey et al. can be interpreted to suggest weighting the business value and the value to the work item each by its own weight and both of which weights correspond to the work item, as required by Group C claims. Unless such specific disclosure, teaching, or suggestion can be found in the references, they cannot be said to render Group C claims unpatentable.

In response, the Examiner asserted that “Walker does teach weighting in teaching a combination ‘in the combination of technicians and jobs for which the total of the technician/job cost value is a minimum’ (column 7, lines 32-34). The waiting is the usage of the attributes that determine the technician/job cost value. Additionally, Bushey does teach incorporation of goals. . . .”

The Examiner’s response does not address applicant’s arguments. That Walker et al. and Bushey et al. teach the general concept of weighting of values does not mean that they teach the particular types of weights for the particular types of measures as are recited in applicant’s claims. The Examiner has failed to show that such particular weightings are disclosed either Walker et al. or in Bushey et al. Applicant asserts that these weightings are not disclosed by the references.

6. The references do not render group D claims unpatentable.

Group D claims further define a weighted business value as “a product of (a) the business value weight corresponding to the work item, and (b) a sum of products of a level of each of said needed skill of the resource and a weight of said needed skill of the work item.” The Examiner asserted that such teaching may be found in Walker et al. at col. 7, lines 11-24. This passage of Walker et al. merely states that factors such as the ability of the technician to perform the job and the amount of non-productive technician time can be taken into account and weighted for probability. It is not seen how this disclosure teaches or suggests either the particular parameters, or the particular computation using those parameters, that are recited in the claims of Group D. For example, applicant asserts that Walker et al. do not disclose, teach, or suggest either skill levels or skill weights, or the weighting of the sum of the products thereof.

Furthermore, Group D claims either define a weighted resource treatment value as “a product of (c) a resource treatment weight corresponding to the work item and (d) a sum of products of each treatment of the resource and a weight of said treatment of the resource,” or define a weighted work-item treatment value as “a product of (c) a work item treatment

weight corresponding to the work item and (d) a sum of products of each treatment of the work item and a weight of said treatment of the work item.” The Examiner asserted that such teaching of the use of attributes and weights in creating a customer model may be found in Bushey et al. at column 2, lines 56-59. This passage of Bushey et al. merely states that the behavioral model of agents is calculated from a detailed profile of their sales strategies, customer service behaviors, and sales performance. It is not seen how this disclosure teaches or suggests either the particular parameters, or the particular computation of those parameters, recited in Group D claims.

In summary, applicant has shown that Group D claims recite particular computations for weighted business value and weighted resource or work-item treatment value that are not disclosed by the references.

In response, the Examiner stated that “Walker does teach ‘skill type distribution’ (column 15, lines 8-9), wherein by definition of the statistical concept of a distribution, a plurality of factors or levels must in fact exist for a distribution to be calculated,” and that Bushey et al. teach incorporation of goals.

The Examiner’s response does not address applicant’s argument. Even if the Examiner’s assertion is completely accurate, it still does not show that Walker et al., either alone or in combination with Bushey et al., teach either a weighted business value or a weighted resource treatment value or a weighted work item treatment value as these are defined in the claims.

The Examiner further responded that “a projected total cost and the value of the cost function for a job as taught by Bushey are in fact a sum of all the costs associated with a job.” Once again, even if the Examiner’s assertion is completely accurate, it does not show that Bushey et al. teach the particular computation of the particular weights and values recited in Group D claims.

7. The references do not render group E claims unpatentable.

Group E claims recite that the sums of products recited in the antecedent Group C and D claims are scaled sums and that the treatments are scaled treatments. The Examiner pointed out that Bushey et al. disclose

weighting customer's attributes to create models and using the model scores to create a best match, and then asserted that "Bushey et al. can also scale the scores." But whether or not Bushey et al. can do something is irrelevant; the question is whether they teach, disclose, or suggest doing so. And in this case, they do not. Applicant fails to find where "scaling sums" is disclosed in Bushey et al. and where application of this concept to sums of products of skill levels and skill weights and to resource or work-item treatments is suggested anywhere by Bushey et al.

In response, the Examiner asserted that "a projected total cost and the value of the cost function for a job as taught by Bushey are in fact a sum of all of the costs associated with a job," and that Bushey et al. teach incorporation of goals. This response is non-responsive to applicant's argument. Even if the Examiner's characterization of Bushey et al. were completely true, it does not disclose scaling of sums, or application thereof to sums of products of skill levels and skill weights and to resource or work-item treatments. The claims of Group E are therefore not rendered unpatentable by the references.

8. The references do not render group F claims unpatentable.

Group F claims recite that selecting a work item in the antecedent Group E claims comprises selecting the work item that has a highest sum of the weighted business value and either the weighted resource-treatment value or the weighted work-item-treatment value. Since it has been shown above in the discussion of Group E claims that Walker et al. and Bushey et al. do not disclose the computation of a weighted business value or a weighted treatment value as defined by the antecedent Group E claims, the references cannot be deemed to disclose selection based on the sum of these (non-existent) values.

The Examiner responded that "Walker does teach weighting 'the combination of the technicians and jobs for which the total of the technician/job cost values is a minimum' (column 7, lines 32-34), where the job costs are a part of a weighting that determines a minimum value," and that Bushey et al. teaches incorporation of goals.

The Examiner's response does not address applicant's argument. Even if the Examiner's assertion were completely accurate, it does not show that Walker et al. teach the summing of values recited in the subject claims. The sentence of Walker referenced by the Examiner, and whose meaning is expounded upon at Walker et al. column 7, lines 35 et seq., merely indicates that Walker et al. determine the cost value of each technician-and-job combination (doublet) and select the one doublet with the lowest cost value. It does not disclose that two separate weighted values are computed and then summed to select the doublet with the highest sum. Hence, applicant's Group F claims are not rendered unpatentable.

9. The references do not render group G claims unpatentable.

Group G claims define a particular formula for the estimated wait time that a work item will have to wait for service. The wait time is defined as "a product of (a) a ratio of a total number of work items waiting for service and an average number of work items waiting for service, and (b) a sum of average wait times of individual said needed skills each weighted by a ratio of the weight of said individual skill and a sum of the weights of the needed skills." The Examiner purported to find a corresponding teaching in Walker et al. at Fig. 16, col. 6, lines 53-63, and col. 7, lines 11-24 and 35-59. This figure and passages describe a time-dependent cost function for each job that takes into account the penalty for failing to meet an agreed time, the ability of the technician to perform the job, a weighting of the costs for probability, and the selection of a lowest-cost function from among possible technician-and-job combinations. But it fails to disclose (1) a ratio of total and average numbers of waiting jobs, (2) average wait times of individual needed skills, (3) weights of individual skills, (4) a sum of (3)s, (5) ratios of (3)s and (4), use of (5) as weights for (2), (6) a sum of (5)s, and (7) a product of (1) and (6). Walker et al. thus cannot be said to disclose, teach, or suggest the Group G claims. Nor is any such teaching to be found in Bushey et al.

The Examiner retorted that "Bushey does teach the number of work items waiting for service 'the request from the customer is placed in a wait queue'

(column 4, line 18). Since the 'customer is placed in a wait queue until the agent on a list of agents becomes available' (column 4, lines 18-19), the wait times of the individual customers is also known. With access to said date, counting the number of people in a wait queue and calculating the average wait time of a plurality of customers wait time is a trivial calculation and would be simple and very obvious to perform. In addition, Bushey does teach incorporation of goals. .
."

Once again, the Examiner's response does not address applicant's argument. Even if the Examiner's assertion were completely accurate, it does not show that Bushey et al. teach the particular wait-time estimation formula that is recited in these claims. Hence, the references do not render the Group G claims unpatentable.

10. The references do not render group H claims unpatentable.

Group H claims recite that, for each available work item that needs skills possessed by a resource, the business value is determined as "a sum across all skills of a product of a skill level of the resource in the skill and skill weight of the work item for the skill." The Examiner purported to find a corresponding disclosure in Walker et al. at col. 7, lines 11-24. The Examiner is mistaken. As was pointed out previously in the discussion of Group D claims, this passage merely states that factors such as the ability of the technician to perform the job and the amount of non-productive technician time can be taken into account and weighted for probability. Walker et al. in general, and this passage in particular, fail to disclose, teach, or suggest resource skill levels for skills, skill weights of the work items for skills, the products thereof, and the sums of these products. The Examiner's assertion that "every resource [of Walker et al.] contains a skill level and is weighted according to this skill level when combined with a work item" is wholly unfounded.

Group H claims further recite that, for each available work item that needs skills possessed by a resource, the work-item-treatment value is determined as "a sum across all work item treatments of a product of the

value of the work item for the work item treatment and a weight of the work item for the work item treatment.” The Examiner purported to find teaching thereof to flow from the disclosure of Bushey et al. of creating a weighted attribute model for each customer, comparing the customer model with the agent model to determine the highest match score, and answering the call with the second best matching agent after a period of time if the customer cannot have the highest-score matched agent. The Examiner’s view is unfounded. The Group H claims define a particular formula for computing work item treatment values, which particular formula is not disclosed by Bushey et al.

The Examiner responded that “Bushy. (sic) does teach that a ‘request from a customer is placed in a wait queue until the agent on the list of optimal agents becomes available’ (column 4, lines 18-19), wherein the optimality of the agents being selected is determined based upon ‘customer service behavior attribute’ (column 3, lines 61-62). Skills are further taught by Walker as ‘the different skills required to do all of the jobs, or the time needed to complete them’ (column 14, lines 53-54). Additionally, Bushey does teach incorporation of goals. . .”, and that “Bushey does teach the number of work items waiting for service ‘the request from the customer is placed in a wait queue’ (column 4, line 18). Since the ‘customer is placed in a wait queue until the agent on a list of agents becomes available’ (column 4, lines 18-19), the wait times of the individual customer is known.”

As has been seen so often above, the Examiner’s response is not responsive to applicant’s argument. Even if the Examiner’s characterizations of the references were completely accurate, they do not show that the references teach either a business value that is “a sum across all skills of a product of a skill level of the resource in the skill and skill weight of the work item for the skill” or a work item treatment value that is “a sum across all work item treatments of a product of the value of the work item for the work item treatment and a weight of the work item for the work item treatment.” Consequently, the rejection of the Group H claims is unfounded.

11. The references do not render group I claims unpatentable.

With respect to Group I claims, applicant had pointed out that these claims, dependent from Group H claims, recite particular work item treatments, and since the references fail to disclose the formula of the antecedent Group H claims for computing work item treatment values, the references likewise do not disclose the use of particular work item treatments in this (non-existent) formula.

The only response that the Examiner could muster was that “‘best combined score’ and ‘sum across all work’ do not fit the form of a formula,” and that Bushey teaches incorporation of goals. This response is again non-responsive, as it fails to challenge and disprove applicant’s assertion that the subject matter of Group I claims is not disclosed in the prior art. The rejection of Group I claims is therefore unfounded.

12. The references do not render group J claims unpatentable.

Group J claims recite three different scaling factors and the application thereof to the computation of business value and work item treatment value. The Examiner pointed out that Bushey et al. disclose creating a customer model using customer attributes, weights, and other information, that the models could be scaled, and that the customer model is compared to agent models to determine the highest match score, and concluded that this teaching would have made it obvious to determine a scaled work item treatment value. Perhaps so. But Walker et al. and Bushey et al. nevertheless fail to disclose a business value scaling factor that is common to all determined work items, a work item value scaling factor that is common for that work item treatment to all of the determined work items, and a value sum scaling factor that is common to all of the determined work items across all work item treatments. Hence, the references cannot be said to render the Group J claims obvious.

The Examiner responded that one of the references (he did not specify which one) “does teach the claimed sum of scaled business value in teaching a total cost. Total cost encompasses all factors that go into evaluating the value of

each individual business and thereby using this value to compare all business values. Bushey also teaches a 'match score' (column 10, line 20) to compare agents with clients. A common element is the 'threshold match value' (column 10, line 38), which each customer does set individually and therefore provides a common frame of reference against which all agents can be measured."

As we have seen above so often, the Examiner's response does not address applicant's argument. Even if the Examiner's assertion is completely accurate, it still does not teach a business value scaling factor that is common to all work items, a work item value scaling factor that is common for that work item treatment to all of the determined work items, and a value sum scaling factor that is common to all of the determined work items across all work item treatments, as explicitly required by the claims. In short, the Examiner has once again failed to make a case for unpatentability of these claims.

CONCLUSION

In each instance of rejecting the claims of Groups A-J, the Examiner found unpersuasive applicant's arguments of patentability of the claims over the references. It's no wonder! In each instance the Examiner has ignored the specific recitations of applicant's claims and has asserted a correspondence between the teaching of the references and some abstracted and generalized concept that may or may not be relevant to applicant's claims. But in no instance has the Examiner shown – or has even attempted to show – that the references disclose the exact matter that is actually recited in applicant's claims. In contrast, applicant has shown that Walker et al. and Bushey et al. in fact do not disclose, teach or suggest their claimed invention.


The Examiner's refutations of applicant's arguments for patentability are inadequate. The burden of proof of unpatentability is on the Examiner. The Examiner must make a prima-facie case of unpatentability by showing that the applied references teach what the claims recite. This the Examiner has failed to do. The Examiner has merely shown that the references have teachings which may generally relate to what applicant claims: he has not shown that the

references have teachings which correspond to what applicant claims. Hence, applicant's claims have not been shown to be unpatentable over the applied references.

For the reasons stated above, applicant respectfully asserts that the Section 103(a) rejection of his claims is not well founded. Applicant therefore respectfully requests that this rejection of his appealed claims be reversed.

Respectfully submitted,

Jon A. Ford

By 
David Volejnicek
Corporate Counsel
Reg. No. 29355
303-538-4154

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Avaya Inc.
Docket Administrator
307 Middletown-Lincroft Road
Room 1N-391
Lincroft, NJ 07738

THE APPEALED CLAIMS

1 1. A method of selecting a resource for a work item, comprising:
2 determining available resources that possess skills needed by the
3 work item;
4 for each of the determined resources, determining a business value
5 of having the resource service the work item, the business value being a
6 measure of qualification of the resource for servicing the work item based
7 on skills of the resource and skill requirements of the work item;
8 for each of the determined resources, determining a value to the
9 resource of servicing the work item, the value to the resource being a
10 measure of how the resource is spending time compared with other
11 resources and goals of the individual resource; and
12 selecting a determined resource that has a best combined value of
13 the business value and the value to the resource, to serve the work item.

1 2. The method of claim 1 wherein:
2 determining a business value comprises
3 determining the business value weighted by a business value
4 weight corresponding to the work item;
5 determining a value to the resource comprises
6 determining the value to the resource weighted by a resource value
7 weight corresponding to the work item; and
8 selecting comprises
9 selecting a determined resource that has a best combined value of
10 the weighted business value and the weighted value to the resource.

1 3. The method of claim 2 wherein:
2 determining a business value comprises
3 determining a weighted business value as a product of (a) the
4 business value weight corresponding to the work item and (b) a sum of

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5 products of a level of each said needed skill of the resource and a weight
6 of said needed skill of the work item; and
7 determining a value to the resource comprises
8 determining a weighted resource treatment value as a product of
9 (c) a resource treatment weight corresponding to the work item and (d) a
10 sum of products of each treatment of the resource and a weight of said
11 treatment of the resource.

1 4. The method of claim 3 wherein:
2 the sums of products are scaled sums, and
3 the treatments are scaled treatments.

1 5. The method of claim 4 wherein:
2 selecting comprises
3 selecting the determined resource that has a highest sum of the
4 weighted business value and the weighted resource treatment value.

1 6. The method of claim 3 wherein:
2 the resource treatments of a resource comprise a time since the
3 resource became available and a time that the resource has not spent
4 serving work items.

1 7. The method of claim 6 wherein:
2 the treatments of the resource further comprise a measure of an
3 effect that serving of the work item would have on a goal of the resource.

1 8. The method of claim 7 wherein:
2 the measure of the effect comprises a difference between (a) a
3 distance of an actual allocation of worktime of the resource among skills
4 from a goal allocation of the worktime of the resource among the skills and
5 (b) a distance of an estimated allocation of the worktime of the resource

6 among the skills if the resource serves the work item from the goal
7 allocation.

1 9. A method of selecting a resource for a work item, comprising:
2 determining available resources that possess skills needed by the
3 work item;
4 for each of the determined resources, determining a business value
5 comprising a sum across all skills of a product of a skill level of the
6 resource in the skill and a skill weight of the work item for the skill;
7 for each of the determined resources, determining a resource
8 treatment value, the resource treatment value being a measure of how the
9 resource is spending time compared with other resources and goals of the
10 individual resource, the resource treatment value comprising a sum across
11 all resource treatments of a product of a value of the resource for the
12 resource treatment and a weight of the work item for the resource
13 treatment; and
14 selecting a determined resource that has a best combined score of
15 its business value and its resource treatment value, to serve the work item

1 10. The method of claim 9 wherein:
2 the resource treatments of a resource comprise a time since the
3 resource became available, a time that the resource has spent not serving
4 work items, and a measure of an effect that serving the work item would
5 have on a goal of the resource.

1 11. The method of claim 9 wherein:
2 determining a business value comprises
3 determining a scaled business value comprising the business value
4 scaled by a first scaling factor that is common to all of the determined
5 resources;
6 determining a resource treatment value comprises

7 for each resource treatment, determining a scaled value of the
8 resource comprising the value of the resource for that resource treatment
9 scaled by a scaling factor that is common for that resource treatment to all
10 of the determined resources, and
11 determining a scaled resource treatment value comprising a sum,
12 scaled by a second scaling factor that is common to all of the determined
13 resources, across all resource treatments of a product of the scaled value
14 of the resource for the resource treatment and a weight of the work item
15 for the resource treatment; and
16 selecting comprises
17 selecting a determined resource that has a best sum of its scaled
18 business value and its scaled resource treatment value to serve the work
19 item.

1 12. The method of claim 11 wherein:

2 each scaling factor comprises a fraction having in its denominator a
3 maximum value of the value to which said scaling factor applies of any of
4 the resources.

1 13. A method of selecting a work item for a resource, comprising:

2 determining available work items that need skills possessed by the
3 resource;

4 for each of the determined work items, determining a business
5 value of having the resource service the work item, the business value
6 being a measure of qualification of the resource for servicing of the work
7 item based on skills of the resource and skill requirements of the work
8 item;

9 for each of the determined work items, determining a value to the
10 work item of being serviced by the resource, the value to the work item
11 being a measure of how the work item is treated compared to other work
12 items and treatment goals of the individual work item; and

13 selecting a determined work item that has a best combined value of
14 the business value and the value to the work item to be served by the
15 resource.

1 14. The method of claim 13 wherein:
2 determining business value comprises
3 determining the business value weighted by a business value
4 weight corresponding to the work item;
5 determining a value to the work item comprises
6 determining the value to the work item weighted by a work item
7 value weight corresponding to the work item; and
8 selecting comprises
9 selecting a determined work item that has a best combined value of
10 the weighted business value and the weighted value to the work item.

1 15. The method of claim 14 wherein:
2 determining a business value comprises
3 determining a weighted business value as a product of (a) the
4 business value weight corresponding to the work item and (b) a sum of
5 products of a level of each said needed skill of the resource and a weight
6 of said needed skill of the work item; and
7 determining a value to the work item comprises
8 determining a weighted work item treatment value as a product of
9 (c) a work item treatment weight corresponding to the work item and (d) a
10 sum of products of each treatment of the work item and a weight of said
11 treatment of the work item.

1 16. The method of claim 15 wherein:
2 the sums of products are scaled sums, and
3 the treatments are scaled treatments.

1 17. The method of claim 16 wherein:
2 selecting comprises
3 selecting the determined work item that has a highest sum of the
4 weighted business value and the weighted work item treatment value.

1 18. The method of claim 15 wherein:
2 the work item treatments of a work item comprise a time that the
3 work item has been waiting for service and an estimated time that the
4 work item will have to wait for service.

1 19. The method of claim 18 wherein:
2 the treatments of a work item further comprise a time by which the
3 work item has exceeded its target wait time.

1 20. The method of claim 18 wherein:
2 the estimated wait time that the work item will have to wait for
3 service comprises a product of (a) a ratio of a total number of work items
4 waiting for service and an average number of work items waiting for
5 service and (b) a sum of average wait times of individual said needed
6 skills each weighted by a ratio of the weight of said individual skill and a
7 sum of the weights of the needed skills.

1 21. A method of selecting a work item for a resource, comprising:
2 determining available work items that need skills possessed by the
3 resource;
4 for each of the determined work items, determining a business
5 value comprising a sum across all skills of a product of a skill level of the
6 resource in the skill and a skill weight of the work item for the skill;
7 for each of the determined work items, determining a work item
8 treatment value, the work item treatment value being a measure of how

9 the work item is treated compared to other work items and treatment goals
10 of the individual work item, the work item treatment value comprising a
11 sum across all work item treatments of a product of the value of the work
12 item for the work item treatment and a weight of the work item for the work
13 item treatment; and
14 selecting a determined work item that has a best combined score of
15 its business value and work item treatment value, to be served by the
16 resource.

1 22. The method of claim 21 wherein:
2 the work item treatments of a work item comprise a time that the
3 work item has spent waiting to be serviced, an estimated time that the
4 item will spend waiting to be serviced, and a time by which the work item
5 has exceeded its target waiting time.

1 23. The method of claim 21 wherein:
2 determining a business value comprises
3 determining a scaled business value comprising the business value
4 scaled by a first scaling factor that is common to all of the determined
5 work items;
6 determining a work item treatment value comprises
7 for each work item treatment, determining a scaled value of the
8 work item comprising the value of the work item for that work item
9 treatment scaled by a scaling factor that is common for that work item
10 treatment to all of the determined work items, and
11 determining a scaled work item treatment value comprising a sum,
12 scaled by a second scaling factor that is common to all of the determined
13 work items, across all work item treatments of a product of the scaled
14 value of the work item for the work item treatment and a weight of the
15 work item for the work item treatment; and
16 selecting comprises

17 selecting a determined work item that has a best sum of its scaled
18 business value and its scaled work item treatment value, to be served by
19 the resource.

1 24. The method of claim 23 wherein:
2 each scaling factor comprises a fraction having in its denominator a
3 maximum value of the value to which said scaling factor applies of any of
4 the work items.

1 27. An apparatus comprising a processor that executes
2 instructions to effect the method of one of claims 1-24.

1 28. An apparatus for selecting a resource for a work item,
2 comprising;
3 means for determining available resources that possess skills
4 needed by the work item;
5 means for determining, for each of the determined resources, a
6 business value of having the resource service the work item, the business
7 value being a measure of qualification of the resource for servicing the
8 work item based on skills of the resource and skill requirements of the
9 work item;
10 means for determining, for each of the determined resources, a
11 value to the resource of servicing the work item, the value to the resource
12 being a measure of how the resource is spending time compared with
13 other resources and goals of the individual resource; and
14 means for selecting a determined resource that has a best
15 combined value of the business value and the value to the resource, to
16 serve the work item.

1 29. An apparatus for selecting a resource for a work item,
2 comprising:

3 means for determining available resources that possess skills
4 needed by the work item;

5 means for determining, for each of the determined resources, a
6 business value comprising a sum across all skills of a product of a skill
7 level of the resource in the skill and a skill weight of the work item for the
8 skill;

9 means for determining, for each of the determined resources, a
10 resource treatment value, the resource treatment value being a measure
11 of how the resource is spending time compared with other resources and
12 goals of the individual resource, the resource treatment value comprising
13 a sum across all resource treatments of a product of a value of the
14 resource for the resource treatment and a weight of the work item for the
15 resource treatment; and

16 means for selecting a determined resource that has a best
17 combined score of its business value and its resource treatment value, to
18 serve the work item.

1 30. An apparatus for selecting a work item for a resource,
2 comprising:

3 means for determining available work items that need skills
4 possessed by the resource;

5 means for determining, for each of the determined work items, a
6 business value of having the resource service the work item, the business
7 value being a measure of qualification of the resource for servicing the
8 work item based on skills of the resource and skill requirements of the
9 work item;

10 means for determining, for each of the determined work items, a
11 value to the work item of being serviced by the resource, the value to the
12 work item being a measure of how the work item is treated compared to
13 other work items and treatment goals of the individual work item; and

14 means for selecting a determined work item that has a best

15 combined value of the business value and the value to the work item to be
16 served by the resource.

1 31. An apparatus for selecting a work item for a resource,
2 comprising:
3 means for determining available work items that need skills
4 possessed by the resource;
5 means for determining, for each of the determined work items, a
6 business value comprising a sum across all skills of a product of a skill
7 level of the resource in the skill and a skill weight of the work item for the
8 skill;
9 means for determining, for each of the determined work items, a
10 work item treatment value, the work item treatment value being a measure
11 of how the work item is treated compared to other work items and
12 treatment goals of the individual work item, the work item treatment value
13 comprising a sum across all work item treatments of a product of the value
14 of the work item for the work item treatment and a weight of the work item
15 for the work item treatment; and
16 means for selecting a determined work item that has a best
17 combined score of its business value and work item treatment value, to be
18 served by the resource.

1 32. An arrangement for selecting a resource for a work item,
2 comprising;
3 an effector of determining available resources that possess skills
4 needed by the work item;
5 an effector of determining, for each of the determined resources, a
6 business value of having the resource service the work item, the business
7 value being a measure of qualification of the resource for servicing the
8 work item based on skills of the resource and skill requirements of the
9 work item;

10 an effector of determining, for each of the determined resources, a
11 value to the resource of servicing the work item, the value to the resource
12 being a measure of how the resource is spending time compared with
13 other resources and goals of the individual resource; and
14 an effector of selecting a determined resource that has a best
15 combined value of the business value and the value to the resource, to
16 serve the work item.

1 33. An arrangement for selecting a resource for a work item,
2 comprising:
3 an effector of determining available resources that possess skills
4 needed by the work item;
5 an effector of determining, for each of the determined resources, a
6 business value comprising a sum across all skills of a product of a skill
7 level of the resource in the skill and a skill weight of the work item for the
8 skill;
9 an effector of determining, for each of the determined resources, a
10 resource treatment value, the resource treatment value being a measure
11 of how the resource is spending time compared with other resources and
12 goals of the individual resource, the resource treatment value comprising
13 a sum across all resource treatments of a product of a value of the
14 resource for the resource treatment and a weight of the work item for the
15 resource treatment; and
16 an effector of selecting a determined resource that has a best
17 combined score of its business value and its resource treatment value, to
18 serve the work item.

1 34. An arrangement for selecting a work item for a resource,
2 comprising:
3 an effector of determining available work items that need skills
4 possessed by the resource;

5 an effector of determining, for each of the determined work items, a
6 business value of having the resource service the work item, the business
7 value being a measure of qualification of the resource for servicing the
8 work item based on skills of the resource and skill requirements of the
9 work item;

10 an effector of determining, for each of the determined work items, a
11 value to the work item of being serviced by the resource, the value to the
12 work item being a measure of how the work item is treated compared to
13 other work items and treatment goals of the individual work item; and

14 an effector of selecting a determined work item that has a best
15 combined value of the business value and the value to the work item to be
16 served by the resource.

1 35. An arrangement for selecting a work item for a resource,
2 comprising:

3 an effector of determining available work items that need skills
4 possessed by the resource;

5 an effector of determining, for each of the determined work items, a
6 business value comprising a sum across all skills of a product of a skill
7 level of the resource in the skill and a skill weight of the work item for the
8 skill;

9 an effector of determining, for each of the determined work items, a
10 work item treatment value, the work item treatment value being a measure
11 of how the work item is treated compared to other work items and
12 treatment goals of the individual work item, the work item treatment value
13 comprising a sum across all work item treatments of a product of the value
14 of the work item for the work item treatment and a weight of the work item
15 for the work item treatment; and

16 an effector of selecting a determined work item that has a best
17 combined score of its business value and work item treatment value, to be
18 served by the resource.

1 36. A computer-readable medium containing instructions which,
2 when executed in a computer, cause the computer to perform selection of
3 a resource for a work item, comprising:
4 determining available resources that possess skills needed by the
5 work item;
6 for each of the determined resources, determining a business value
7 of having the resource service the work item, the business value being a
8 measure of qualification of the resource for servicing the work item based
9 on skills of the resource and skill requirements of the work item;
10 for each of the determined resources, determining a value to the
11 resource of servicing the work item, the value to the resource being a
12 measure of how the resource is spending time compared with other
13 resources and goals of the individual resource; and
14 selecting a determined resource that has a best combined value of
15 the business value and the value to the resource, to serve the work item.

1 37. The medium of claim 36 wherein:
2 determining a business value comprises
3 determining the business value weighted by a business value
4 weight corresponding to the work item;
5 determining a value to the resource comprises
6 determining the value to the resource weighted by a resource value
7 weight corresponding to the work item; and
8 selecting comprises
9 selecting a determined resource that has a best combined value of
10 the weighted business value and the weighted value to the resource.

1 38. The medium of claim 37 wherein:
2 determining a business value comprises
3 determining a weighted business value as a product of (a) the

4 business value weight corresponding to the work item and (b) a sum of
5 products of a level of each said needed skill of the resource and a weight
6 of said needed skill of the work item; and
7 determining a value to the resource comprises
8 determining a weighted resource treatment value as a product of
9 (c) a resource treatment weight corresponding to the work item and (d) a
10 sum of products of each treatment of the resource and a weight of said
11 treatment of the resource.

1 39. The medium of claim 38 wherein:
2 the sums of products are scaled sums, and
3 the treatments are scaled treatments.

1 40. The medium of claim 39 wherein:
2 selecting comprises
3 selecting the determined resource that has a highest sum of the
4 weighted business value and the weighted resource treatment value.

1 41. The medium of claim 38 wherein:
2 the resource treatments of a resource comprise a time since the
3 resource became available and a time that the resource has not spent
4 serving work items.

1 42. The medium of claim 41 wherein:
2 the treatments of the resource further comprise a measure of an
3 effect that serving of the work item would have on a goal of the resource.

1 43. The medium of claim 42 wherein:
2 the measure of the effect comprises a difference between (a) a
3 distance of an actual allocation of worktime of the resource among skills
4 from a goal allocation of the worktime of the resource among the skills and

5 (b) a distance of an estimated allocation of the worktime of the resource
6 among the skills if the resource serves the work item from the goal
7 allocation.

1 44. A computer-readable medium containing instructions which,
2 when executed in a computer, cause the computer to perform selection of
3 a resource for a work item, comprising:
4 determining available resources that possess skills needed by the
5 work item;
6 for each of the determined resources, determining a business value
7 comprising a sum across all skills of a product of a skill level of the
8 resource in the skill and a skill weight of the work item for the skill;
9 for each of the determined resources, determining a resource
10 treatment value, the resource treatment value being a measure of how the
11 resource is spending time compared with other resources and goals of the
12 individual resource, the resource treatment value comprising a sum across
13 all resource treatments of a product of a value of the resource for the
14 resource treatment and a weight of the work item for the resource
15 treatment; and
16 selecting a determined resource that has a best combined score of
17 its business value and its resource treatment value, to serve the work
18 item.

1 45. The medium of claim 44 wherein:
2 the resource treatments of a resource comprise a time since the
3 resource became available, a time that the resource has spent not serving
4 work items, and a measure of an effect that serving the work item would
5 have on a goal of the resource.

1 46. The medium of claim 44 wherein:
2 determining a business value comprises

3 determining a scaled business value comprising the business value
4 scaled by a first scaling factor that is common to all of the determined
5 resources;
6 determining a resource treatment value comprises
7 for each resource treatment, determining a scaled value of the
8 resource comprising the value of the resource for that resource treatment
9 scaled by a scaling factor that is common for that resource treatment to all
10 of the determined resources, and
11 determining a scaled resource treatment value comprising a sum,
12 scaled by a second scaling factor that is common to all of the determined
13 resources, across all resource treatments of a product of the scaled value
14 of the resource for the resource treatment and a weight of the work item
15 for the resource treatment; and
16 selecting comprises
17 selecting a determined resource that has a best sum of its scaled
18 business value and its scaled resource treatment value to serve the work
19 item.

1 47. The medium of claim 46 wherein:
2 each scaling factor comprises a fraction having in its denominator a
3 maximum value of the value to which said scaling factor applies of any of
4 the resources.

1 48. A computer-readable medium containing instructions which,
2 when executed in a computer, cause the computer to perform selection of
3 a work item for a resource, comprising:
4 determining available work items that need skills possessed by the
5 resource;
6 for each of the determined work items, determining a business
7 value of having the resource service the work item, the business value
8 being a measure of qualification of the resource for servicing of the work

9 item based on skills of the resource and skill requirements of the work
10 item;
11 for each of the determined work items, determining a value to the
12 work item of being serviced by the resource, the value to the work item
13 being a measure of how the work item is treated compared to other work
14 items and treatment goals of the individual work item; and
15 selecting a determined work item that has a best combined value of
16 the business value and the value to the work item to be served by the
17 resource.

1 49. The medium of claim 48 wherein:
2 determining business value comprises
3 determining the business value weighted by a business value
4 weight corresponding to the work item;
5 determining a value to the work item comprises
6 determining the value to the work item weighted by a work item
7 value weight corresponding to the work item; and
8 selecting comprises
9 selecting a determined work item that has a best combined value of
10 the weighted business value and the weighted value to the work item.

1 50. The medium of claim 49 wherein:
2 determining a business value comprises
3 determining a weighted business value as a product of (a) the
4 business value weight corresponding to the work item and (b) a sum of
5 products of a level of each said needed skill of the resource and a weight
6 of said needed skill of the work item; and
7 determining a value to the work item comprises
8 determining a weighted work item treatment value as a product of
9 (c) a work item treatment weight corresponding to the work item and (d) a
10 sum of products of each treatment of the work item and a weight of said

11 treatment of the work item.

1 51. The medium of claim 50 wherein:
2 the sums of products are scaled sums, and
3 the treatments are scaled treatments.

1 52. The medium of claim 51 wherein:
2 selecting comprises
3 selecting the determined work item that has a highest sum of the
4 weighted business value and the weighted work item treatment value.

1 53. The medium of claim 50 wherein:
2 the work item treatments of a work item comprise a time that the
3 work item has been waiting for service and an estimated time that the
4 work item will have to wait for service.

1 54. The medium of claim 53 wherein:
2 the treatments of a work item further comprise a time by which the
3 work item has exceeded its target wait time.

1 55. The medium of claim 53 wherein:
2 the estimated wait time that the work item will have to wait for
3 service comprises a product of (a) a ratio of a total number of work items
4 waiting for service and an average number of work items waiting for
5 service and (b) a sum of average wait times of individual said needed
6 skills each weighted by a ratio of the weight of said individual skill and a
7 sum of the weights of the needed skills.

1 56. A computer-readable medium containing instructions which,
2 when executed in a computer, cause the computer to perform a selection
3 of a work item for a resource, comprising:

4 determining available work items that need skills possessed by the
5 resource;
6 for each of the determined work items, determining a business
7 value comprising a sum across all skills of a product of a skill level of the
8 resource in the skill and a skill weight of the work item for the skill;
9 for each of the determined work items, determining a work item
10 treatment value, the work item treatment value being a measure of how
11 the work item is treated compared to other work items and treatment goals
12 of the individual work item, the work item treatment value comprising a
13 sum across all work item treatments of a product of the value of the work
14 item for the work item treatment and a weight of the work item for the work
15 item treatment; and
16 selecting a determined work item that has a best combined score of
17 its business value and work item treatment value, to be served by the
18 resource.

1 57. The medium of claim 56 wherein:
2 the work item treatments of a work item comprise a time that the
3 work item has spent waiting to be serviced, an estimated time that the
4 item will spend waiting to be serviced, and a time by which the work item
5 has exceeded its target waiting time.

1 58. The medium of claim 56 wherein:
2 determining a business value comprises
3 determining a scaled business value comprising the business value
4 scaled by a first scaling factor that is common to all of the determined
5 work items;
6 determining a work item treatment value comprises
7 for each work item treatment, determining a scaled value of the
8 work item comprising the value of the work item for that work item
9 treatment scaled by a scaling factor that is common for that work item

10 treatment to all of the determined work items, and
11 determining a scaled work item treatment value comprising a sum,
12 scaled by a second scaling factor that is common to all of the determined
13 work items, across all work item treatments of a product of the scaled
14 value of the work item for the work item treatment and a weight of the
15 work item for the work item treatment; and
16 selecting comprises
17 selecting a determined work item that has a best sum of its scaled
18 business value and its scaled work item treatment value, to be served by
19 the resource.

1 59. The medium of claim 58 wherein:
2 each scaling factor comprises a fraction having in its denominator a
3 maximum value of the value to which said scaling factor applies of any of
4 the work items.